

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Masanori OGAWA et al.

Serial No.: 10/518,971

Group Art Unit: 1771

Date Filed: December 21, 2004

Examiner: Daniel Zirker

For: ADHESIVE SHEET AND STACKING MATERIAL

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Commissioner for Patents
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DECLARATION UNDER 37 C.F.R. § 1.132

1. I make this declaration to report comparing the use of (1) novolak type phenolic resin powder and (2) urea formaldehyde resin powder in the processes and products described below.
2. I am employed by the assignee of this patent application as a manager, and I directed and supervised the tests and observations reported below.
3. Based on these tests and observations, I conclude that the use of novolak type phenolic resin powder as described below results in a laminated sheet product having significantly superior moisture resistance compared with the use of urea formaldehyde resin powder.
4. **Test 1:**

A phenol-alkyl resorcin formaldehyde precondensate was impregnated in a non-woven fabric sheet having unit weight of 50 g/m² in an amount of 20 g/m² as solid content. On one side of the non-woven fabric sheet, a novolak

type phenolic resin powder having particle size of 200 μm in which 20% by weight hexamethylene tetramine is mixed was scattered in an amount of 7 g/m^2 and then the sheet was dried by heating at 90°C for 3 minutes to manufacture a bondable sheet.

The bondable sheet then was put on a glass wool sheet serving as a core layer, which core layer had a unit weight of 800 g/m^2 and in which a resol type phenolic resin was impregnated to comprise 20% by weight, so that the side of bondable sheet having the novolak type phenolic resin powder contacted a surface of the glass wool sheet.

The resulting laminated sheet (bondable sheet and glass wool sheet) was hot pressed at 200°C for 60 seconds to obtain a molded laminated sheet A having a thickness of 5 mm.

5. **Comparative test 1:**

Comparative test 1 differed from Test 1 in that it used finely powdered urea formaldehyde moulding resin instead of novolak type phenolic resin powder, to obtain a molded laminated sheet B.

6. Ten pieces A and ten pieces B, each having an area 300x300 mm, were cut from each of laminated sheets A and B, respectively.

7. **Water dipping-heating cycle test:**

Each of the ten pieces A and 10 pieces B was dipped in water kept at 40°C in a tank and, after 1 hr in the water, was immediately put in a ventilation heating chamber for 3 hrs. This water immersion-heating cycle was repeated 5 times, after which each piece was inspected.

8. **Hot water dipping test:**

The same 10 pieces A and 10 pieces B were used in this test. Each test piece was dipped in hot water kept at $70\pm 2^{\circ}\text{C}$ in a tank. After 120 ± 2 hrs each piece was taken out of the tank and inspected.

9. The observation yielded the following results:

Time of observation	Test pieces A (with use of novolak type phenolic resin powder)	Test pieces B (with use of urea formaldehyde moulding resin powder)
After the water dipping- heating cycle test	No apparent peeling of the non-woven fabric sheet or other defects	Some peeling of the non-woven fabric sheet
After the hot water dipping test	No apparent peeling of the non-woven fabric sheet or other defects	Remarkable peeling of the non-woven fabric sheet

I declare under the penalty of perjury that the above is true to the best of my knowledge.

Date: June 4, 2007

Kuninori Ito

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